

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

SRM Number: 999b
MSDS Number: 999b
SRM Name: Potassium Chloride

Date of Issue: 23 March 2006

MSDS Coordinator: Mario J. Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: This Standard Reference Material (SRM) is intended for use as an analytical standard of known potassium (K) and chloride (Cl⁻) content. A unit of SRM 999b consists of a single glass bottle containing 30 g of the material.

Substance: Potassium Chloride

Other Designations: KCl; potassium monochloride; slow K; super K; potassium muriate; monopotassium chloride; muriate of potash.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Potassium Chloride
CAS Number:	7447-40-7
EC Number (EINECS):	231-211-8
Nominal Mass Fraction (%):	100
EC Classification:	Xn (Harmful); not classified in Annex I of Directive 67/548/EEC
EC Risk:	R22 (harmful if swallowed) R36/37/38 (irritating to eyes, respiratory system and skin)
EC Safety:	S22 (do not breathe dust) S24/25 (avoid contact with skin and eyes)

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: This material can irritate the skin, eyes, and respiratory system. It is also harmful if swallowed.

Physical Hazards: Some mixtures are explosive (Section 10). Container may shatter.

Potential Health Effects

Inhalation:	Potassium chloride dust can irritate the respiratory system.
Skin Contact:	This material can cause skin irritation, particularly if the skin is moist or abraded.
Eye Contact:	Potassium chloride dust can cause mechanical eye irritation and possible abrasion.

Ingestion: Ingestion of this material can cause nausea, vomiting, diarrhea, and stomach pain. In rare cases, potassium poisoning may result from a large dose or prolonged exposure. Effects may include changes in blood pressure, irregular heartbeat, drowsiness, dizziness, disorientation, internal bleeding, and paralysis.

Medical Conditions Aggravated by Exposure: Hyperkalemia; kidney disease (makes it harder to eliminate excess potassium); pre-existing conditions affecting any of the target organs, such as asthma, COPD, conjunctivitis, or dermatitis.

Listed as a Carcinogen/ Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u>X</u>
In the International Agency for Research on Cancer (IARC) Monographs	_____	<u>X</u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u>X</u>

4. FIRST AID MEASURES

Inhalation: Move the person to fresh air immediately. Qualified medical personnel may start CPR or give oxygen if necessary. Get medical aid if necessary, and bring the container or label.

Skin Contact: Remove contaminated clothing and shoes. Flush affected skin with water for at least 1 minute, then wash thoroughly with soap and water. If skin irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

Eye Contact: Remove contact lenses (if any). Do not allow victim to rub eyes or keep eyes closed. Flush eyes with large amounts of running water for at least 30 minutes, keeping eyelids open and raising lids to remove all chemical. If eye irritation persists, get medical aid and bring the container or label.

Ingestion: Contact a poison control center immediately for instructions. Wash out mouth with water, but do not induce vomiting. Get medical aid at once, and bring the container or label.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Potassium chloride alone is not flammable or explosive, but it can form an explosive mixture with sulfuric acid and potassium permanganate. In a fire, small amounts of chlorine gas may be released.

Extinguishing Media: Use extinguishing media appropriate to the surrounding fire: water spray, dry chemical, carbon dioxide, or foam.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): N/A

Autoignition (°C): N/A

Lower Explosive Limit (LEL): N/A

Upper Explosive Limit (UEL): N/A

Flammability Class (OSHA): N/A

Products of Combustion: Thermal decomposition of potassium chloride may produce chlorine gas.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Isolate the spill area and absorb spilled liquid with sand or other non-combustible material. Cleanup personnel must wear personal protective equipment (Section 8). Sweep up solid material and place in a suitable container for reclamation or disposal, using a method that does not generate dust. If the spill is large, do not flush it to a sewer or allow it to enter a watercourse.

Disposal: Refer to Section 13, Disposal Considerations.

7. HANDLING AND STORAGE

Storage: Store in tightly closed container in a cool, dry, well-ventilated place and protect from mechanical damage. Keep away from incompatible materials.

Safe Handling Precautions: Wear suitable gloves, or wash hands after contact.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: None established for this material. Limits for total dust, nuisance dust, or particulates not otherwise classified:

ACGIH TLV-TWA: 10 mg/m³ (inhalable particles); 3 mg/m³ (respirable particles)

OSHA TWA-PEL: 15 mg/m³ (total dust); 5 mg/m³ (respirable dust)

UK WEL: 10 mg/m³ (total inhalable dust); 4 mg/m³ (respirable dust)

Ventilation: Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

Respirator: If necessary, refer to the *NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

Eye Protection: Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

Personal Protection: Wear appropriate gloves and protective clothing to minimize contact with skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: Potassium Chloride

Appearance and Odor: White crystals or granules, no odor

Relative Molecular Weight: 74.55

Molecular Formula: KCl

Density (g/cm³): 1.984

Solvent Solubility: Soluble in glycerol, alkali, ether; slightly soluble in alcohol; insoluble in acetone.

Water Solubility: Soluble (23.8% @ 20°C)

Boiling Point (°C): 1413 (2575°F)

Melting Point (°C): 770 (1418°F)

pH: 5.4–8.6 (5% solution)

10. STABILITY AND REACTIVITY

Stability: X Stable Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Contact with incompatible materials.

Incompatible Materials: Nitric acid (may release nitrosyl chloride); any strong acids (may release chlorine gas); sulfuric acid and potassium permanganate (possible explosion hazard); halogens (may react violently with bromine trifluoride); metals (corrosion may occur).

Fire/Explosion Information: See Section 5.

Hazardous Decomposition: Thermal decomposition of potassium chloride may produce chlorine gas.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Toxicity Data:

Rat, oral: LD₅₀ = 2600 mg/kg
Mouse, oral: LD₅₀ = 1500 mg/kg
Man, oral: LD_{Lo} = 20 mg/kg
Woman, oral: LD_{Lo} = 60 mg/kg/day

Target Organ(s): Respiratory tract, skin, eyes, GI tract.

Mutagen/Teratogen: This material is not considered to be a human reproductive hazard.

Health Effects: See Section 3.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Carp (*Cyprinus carpio*): LC₅₀ (5 hrs) = 12,500 mg/L
Mosquitofish (*Gambusia affinis*): LC₅₀ (96 hrs) = 920 mg/L
Water flea (*Daphnia magna*): EC₁₀₀ (24 hrs) = 1010 mg/L

Environmental Fate: If released to the environment, this material can persist in natural water.

Environmental Summary: Potassium chloride is not acutely toxic to most aquatic organisms, but its environmental effects have not been fully evaluated. Large spills should be contained to prevent water contamination.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302: Not regulated.

SARA Title III Section 304: Not regulated.

SARA Title III Section 313: Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not regulated; D2B, materials causing other toxic effects.

EUROPEAN REGULATIONS

EU/EC Classification: Xn (Harmful); not classified in Annex I of Directive 67/548/EEC

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed

TSCA 12(b), Export Notification: Not listed

16. OTHER INFORMATION

Sources:

IUCLID Chemical Data Sheet: Potassium Chloride. European Chemicals Bureau, 19 Feb 2000.

PAN Pesticides Database: Potassium Chloride.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, September 2005 edition. DHHS (NIOSH) Publication No. 2005-151.

U.S. National Institute of Standards and Technology, Certificate of Analysis: Standard Reference Material® 918a, Potassium Chloride (Clinical Standard). 17 September 2003.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.